

## ABSTRACT

The present invention provides a set of methods and compositions for homogeneous coupled luminescent assays of cytotoxicity and/or proliferation of cells, as well as for enzymatic activity. In both cases the activities of the enzymes of interest are coupled to  
5 production of a high-energy molecule, which serves as a substrate for the production of light by a luciferase, typically in a single reagent mixture, with a useful readout available in 1-5 minutes. Individual cytotoxicity and proliferation signals can be measured from a single sample in 6 minutes or less. The invention also provides a 3-minute, one-step phosphatase assay. The ability to couple the activity of interest to light production in a one-  
10 step procedure gives rise to extremely rapid and flexible methods for measurement of cytotoxic effects and enzymatic activities. The assay methods are highly suitable for use in high-throughput screening procedures.